

Bracket 1

Entrant Information

I am submitting this entry as:

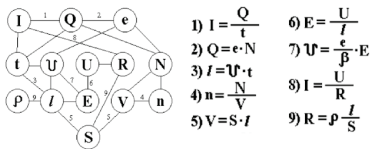
an individual entrant

Big Idea Information

Title of your Big Idea

objective measures of physics knowledge

Upload an image to represent your Big Idea or your team.



<https://skild-prod.s3.amazonaws.com/nsfideamachine/uploads/6207746696351-team138558-entry124656-section63687-mocc.png>

What are your scientific or engineering research interests or areas of expertise?

teaching mathematics and physics; teacher professional development.

What is the compelling question or challenge?

Developing methodology and methods for unification of the measurement of student content knowledge

What do we know now about this Big Idea and what are the key research questions we need to address?

This is a novel method very different from all current ones, NSF does not know about it

Why does it matter? What scientific discoveries, innovations, and desired societal outcomes might result from investment in this area?

Because education and a science of education cannot be advanced and effectively managed without objective measures of content knowledge

If we invest in this area, what would success look like?

Developing objective measures of content knowledge will help developed science of education and would greatly advance educational practices (akin physics → engineering)

Why is this the right time to invest in this area?

Because education reform badly needs objective methods for measuring the results

Please give us three key words describing the Big Idea.

Paradigm change, content knowledge, objective measures

Publication/Citation References (optional)

In the boxes below, you may list up to 3 publication/citation references, either by text or link.

Reference #1

Graphical Approach for Structuring Physics Knowledge

Reference #1 URL

<http://www.cognisity.how/2018/04/MOCC.html>

Reference #2

A General “Algorithm” for Creating a Solution to a Physics Problem

Reference #2 URL

<http://www.cognisity.how/2018/02/Algorithm.html>

Reference #3

What does “Thinking as a Physicist” mean?

Reference #3 URL

<http://www.cognisity.how/2018/02/thinkphy.html>

Agreements and Validations

I consent to NSF's use and display of the submitted information and contestants' names and likenesses.

I agree

I confirm that all individual, teacher, and team entrants meet the age and citizenship/residence requirements, and agree to abide by all rules of the NSF 2026 Idea Machine as described in the

https://www.nsf.gov/news/special_reports/nsf2026ideamachine/eligibilityandrules.jsp
[eligibility criteria and rules](https://www.nsf.gov/news/special_reports/nsf2026ideamachine/eligibilityandrules.jsp)

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I agree

Forms and Releases

All individual and team entrants must be at least 14 years of age as of September 1, 2018.

Individuals: If you are under 18 years of age, please upload a completed parental/guardian

permission form (located in the Quick Links to your left) here.

Team leaders: Please collect the signed parental/guardian permission form for any team members younger than 18 years of age (including yourself) and combine them into one document to be uploaded here.

Teachers entering on behalf of high school classes are not required to submit parental/guardian forms on behalf of their classes.